

C1 The present invention is directed to the 2000 series composition aluminum alloys as defined by the Aluminum Association wherein the composition comprises in weight percent about 3.60 to 4.25 copper, about 1.00 to 1.60 magnesium, about 0.30 to 0.80 manganese, no greater than 0.05 silicon, no greater than 0.07 iron, no greater than 0.06 titanium, no greater than 0.002 beryllium, the remainder aluminum and incidental elements and impurities. Preferably, the composition comprises in weight percent 3.85 to 4.05 copper, 1.25 to 1.45 magnesium, 0.55 to 0.65 manganese, no greater than 0.04 silicon, no greater than 0.05 iron, no greater than 0.04 titanium, no greater than 0.002 beryllium, the remainder aluminum and incidental elements and impurities. When citing a range of the alloy composition, the range includes all intermediate weight percents such as for magnesium, 1.00 would include 1.01 or 1.001 on up through and including 1.601 up to 1.649. This incremental disclosure includes each component of the present alloy.

In the practice of the invention, the heat treating temperature, T_{\max} , should be controlled at as high a temperature as possible while still being safely below the lowest incipient melting temperature of the alloy, which is about 935°F (502°C). The observed improvements are selected from the group consisting of plane strain and plane stress fracture toughness, fatigue resistance, and fatigue crack growth resistance, and combinations thereof while essentially maintaining the strength, is accomplished by ensuring that the second phase particles derived from Fe and Si and those derived from Cu and/or Mg are substantially eliminated by composition control and during the heat treatment. The Fe bearing second phase particles are minimized by using high purity base metal with low Fe content. While it is desirable to have no Fe or Si at all, but for the commercial cost thereof, a low Fe and Si content according to the preferred composition range described hereinabove is acceptable for the purposes of the present invention.

IN THE CLAIMS:

Please amend claims 1, 3, and 11-16 as follows. Pursuant to 37 C.F.R. 1.121, the following are clean copies of the amended claims. Marked-up versions of claims 1, 3, and 11-16 are attached as a separate sheet.